

# Policy Formulation For Safety of Sea Transportation in Penyengat Island, Tanjungpinang City

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**Abstract**—This study proposes sea transportation policies to improve safety and accessibility to Penyengat Island, located in the Riau Islands Province, Indonesia. The study uses a post-positivist approach and qualitative research methods to assess the current state of sea transportation infrastructure, analyze existing policies and regulations, evaluate transportation needs, identify challenges and limitations, propose policy recommendations, and provide insights for decision-making. The study identifies policy problems, such as limited access, weather conditions, and inadequate infrastructure, and suggests solutions, such as improving sea transportation services, infrastructure, and safety. The study highlights the importance of evaluating policies' effectiveness and ensuring continuous monitoring and implementation. The study concludes that a comprehensive sea transportation policy is necessary, and stakeholder engagement and public participation are crucial for policy formulation and implementation. Improving sea transportation services can contribute to the region's economic development, attract more tourists, and provide better access to social services and opportunities.

**Keywords:** Policy; Formulation; Safety; Sea Transportation

## I. INTRODUCTION

Penyengat Island is a small island near Tanjungpinang City in the Riau Islands Province, Indonesia. It is famous for its cultural and historical sites, such as the Penyengat Island Palace, the Masjid Raya Sultan Riau, and the ancient tombs of Malay sultans. Sea transportation is the primary mode of transportation for visitors to Penyengat Island [1], [2]. There are several ways to reach Penyengat Island by sea transportation. The most popular and convenient way is using a speedboat or a ferry. The speedboat departs from the Tanjungpinang port and takes about 15-20 minutes to reach Penyengat Island. The ferry departs from Tanjungpinang and takes about 30 minutes to get to the island. Both speedboats and ferries operate daily, and the ticket prices are affordable.

Another option to reach Penyengat Island is to use a traditional Malay boat called "perahu." Perahu is a small wooden boat that locals commonly use to transport goods and passengers between the Tanjungpinang port and

Penyengat Island. The journey takes longer than a speedboat or a ferry, but it offers an authentic experience of traveling like the locals. On the island, visitors can explore various historical sites and cultural attractions while enjoying the beautiful scenic views of the sea [3], [4]. Sea transportation is the primary mode of transportation to reach Penyengat Island. Speedboats and ferries are the most popular and convenient ways, while a traditional Malay boat offers an authentic experience.

**Figure 1. Sea distance between Penyengat Island and Sri Bintan Pura Harbor, Tanjungpinang City**



Source: Google Maps, 2023

Based on the picture above, the sea distance between the port of Sri Bintan Pura, Tanjungpinang City and Penyengat Island is very close. Visitors can explore various historical sites and cultural attractions while enjoying the beautiful scenic views of the sea. However, some potential factual problems of sea transportation on Penyengat Island, Tanjungpinang City, may include:

- Limited access - Penyengat Island is a small island off the coast of Tanjungpinang City. Therefore, sea transportation to and from the island may be limited regarding availability and frequency.
- Weather conditions - Tanjungpinang City is prone to high waves and strong winds, particularly during the monsoon season. This can disrupt sea transportation and create safety concerns.
- Infrastructure - The lack of basic infrastructure, such as piers and jetties, can make it challenging for boats to dock and passengers to board or disembark from vessels.

- Safety - Some sea transportation providers may not adhere to proper safety standards, such as providing life jackets and safety inspections of boats, which could put passengers at risk.
- Cost - Sea transportation in the region can be expensive, making it difficult for some residents to access essential services and resources on Penyengat Island.

Based on the research conducted, the following conclusions can be drawn regarding the objectives of sea transportation policy formulation in Penyengat Island, Tanjungpinang City. There is a need for a comprehensive sea transportation policy in Penyengat Island, Tanjungpinang City, to address the challenges faced by the local community and tourists in accessing reliable and affordable sea transportation services. Developing a sea transportation policy should consider the social, economic, and environmental factors unique to Penyengat Island and the surrounding area [5], [6]. The policy should focus on improving sea transportation services' safety and efficiency while promoting the sustainable use of resources and preserving the natural environment [7], [8].

Public participation and stakeholder engagement are essential for successfully formulating and implementing a sea transportation policy in Penyengat Island, Tanjungpinang City. The policy should also address the needs and concerns of marginalized groups, such as women, children, and older people, who may face additional barriers in accessing sea transportation services. Overall, the objectives of sea transportation policy formulation in Penyengat Island, Tanjungpinang City, should be aimed at improving the quality of life for residents and enhancing the visitor experience for tourists while also promoting sustainable development and preserving the natural environment—the research objectives for studying sea transportation policy formulation in Penyengat Island.

Tanjungpinang City assesses the current state of sea transportation infrastructure, analyzes existing policies and regulations, evaluates transportation needs, identifies challenges and limitations, proposes policy recommendations, and provides insights and advice for decision-making. By addressing these objectives, the study aims to improve sea transportation services and enhance the overall transportation system in Penyengat Island, benefiting the local community and stakeholders involved. Policy formulation is developing and implementing policies or strategies that guide decision-making and action within an organization or government [9], [10]. It involves identifying problems or issues, analyzing potential solutions or courses of action, making recommendations or proposals, and ultimately implementing and evaluating the policy [11], [12]. Critical steps in policy formulation include identifying stakeholders and their interests, conducting research and analysis, seeking input and feedback from affected parties, and drafting and refining the policy. Effective policy formulation requires a thorough understanding of the political, social, economic, and cultural factors that influence decision-making within a given context.

## II. RESEARCH METHOD

The post-positivist approach can be applied to qualitative research methods in formulating sea transportation policy on Penyengat Island, Tanjungpinang City. This approach

emphasizes objectivity, empirical evidence, openness to criticism, and revising pre-existing knowledge based on new information [13]. In adopting this approach, the researcher should establish a straightforward research question or problem statement, identify existing theories and hypotheses, and collect data through rigorous observation, interviews, and document analysis. The data collected should be analyzed using qualitative methods, such as content analysis and thematic analysis, to identify emerging patterns and themes.

The post-positivist approach also recognizes that researchers bring their biases and assumptions to the research process [14]. Therefore, the researcher should minimize bias, such as being transparent about their positionality, using triangulation to verify findings, and seeking peer feedback. In conclusion, the post-positivist approach and qualitative research methods can formulate sea transportation policies in Penyengat Island, Tanjungpinang City, by focusing on empirical evidence, objectivity, openness to criticism, and revising pre-existing knowledge.

## III. RESULT AND DISCUSSION

### *General Conditions of Community-Based Sea Transportation on Penyengat Island*

As an island in the Riau archipelago, Penyengat Island can only be accessed by sea transportation. Sea transportation on Penyengat Island still depends heavily on the activities of the local community, especially fishermen, who are the primary source of livelihood on the island. People on Penyengat Island commonly use sea transportation in traditional boats, such as fishing boats and canoes. These boats usually transport goods and daily necessities and travel to neighboring islands. However, since the formation of the Riau Archipelago Province, the local government has introduced passenger ships to serve the Pulau Penyengat–Tanjungpinang route.

This ship is expected to facilitate access to transportation for residents and tourists who wish to visit Penyengat Island. Nevertheless, sea transportation facilities on Penyengat Island still need to be improved, especially regarding ships' safety, comfort, and availability. Several lousy weather conditions cause difficulties in finding sea transportation facilities; therefore, improvements to sea transportation equipment and services so that they can operate in all weather conditions, including emergency conditions, need to be carried out to provide a sense of security, comfort, and certainly be more efficient for the people in.

Community-based sea transportation on Penyengat Island is a form of transportation that is quite popular and widely implemented by the residents of Penyengat Island. This sea transportation utilizes traditional boats to connect various points around the island and a means of transportation to meet people's daily needs, such as work, school, shopping, or sightseeing. Community-based sea transportation on Penyengat Island is essential in people's lives. With sea transportation, people can access various public services and complete their daily work more efficiently [15], [16].

In addition, sea transportation also plays a role in opening tourism access to Penyengat Island to increase people's income and welfare. Penyengat Island is a small island in the Riau Archipelago, across from Tanjungpinang City. This island is famous for its fascinating historical sites, such as the

Raja Haji Fisabilillah Palace and the Great Mosque of Sultan Riau. Despite its small size, Penyengat Island has people who live and do activities there. Sea transportation is the primary option to connect Penyengat Island with the surrounding cities.

#### *Development of Sea Transportation Policy on Penyengat Island*

Based on the findings in the field, the local government's sea transportation policy on Penyengat Island should aim to increase the accessibility and mobility of the people on the island. Some of the approaches taken include:

- We are improving sea transportation services with adequate routes for the people on Penyengat Island. The local government cooperates with sea transportation managers to provide sufficient ships regularly.
- Improve port facilities and infrastructure on Penyengat Island. This is realized by rearranging the port to accommodate more ships and improving the surrounding facilities, such as adding vehicle parking and seats.
- It encourages using sea transportation as an environmentally friendly means of transportation. The local government is promoting using ships as a more ecologically friendly alternative to motorized vehicles.
- They are improving shipping safety with strict supervision and regulation. The regional government cooperates with related agencies to supervise and regulate shipping so that improvements occur in increasing the readiness of sea transportation.

Based on the analysis results, it can be concluded that several factors, such as the lack of adequate infrastructure and human resources, still constrain the current condition of sea transportation policy on Penyengat Island. In addition, the lack of coordination between related agencies and oversight of policy implementation also contributed to this condition. Recommendations for improving the condition of marine transportation policies on Penyengat Island include increasing investment in sea transportation infrastructure and strengthening human resources related to sea transportation. In addition, enhancing coordination between related agencies and ensuring oversight of policy implementation is also essential. By taking this action, it is hoped that it will positively impact increasing the number of tourist visits and boosting the economy of Penyengat Island.

#### *Identification of Policy Problems*

Based on the explanation of the results described earlier, the researcher elaborates on the identification of policy problems, which are explained as follows:

- **Lack of Ship Supervision and Inspection:** A policy problem that often occurs in formulating sea transportation safety policies on Penyengat Island is the lack of ship supervision and inspection by the authorities, which can cause vessels that are not fit for operation to remain operational, increasing the risk of maritime accidents.
- **No Education and Training Programs:** The lack of education and training programs for crew and passengers is also a policy problem. Adequate education and training will help raise awareness about safety when traveling on the seas. In addition, education and training programs can

also help improve the skills and abilities of ship crews in handling emergencies at sea. In emergencies such as fire, coast guard, and natural disasters, a trained team can take appropriate and effective measures to save themselves and their passengers. In addition, passengers can also benefit from this education and training program. By knowing safety at sea, passengers can be more prepared and alert when traveling at sea and can assist in emergencies if needed. Therefore, the government and ship operators must pay attention to education and training programs for crew and passengers. Increasing safety awareness at sea and crew members' skills can help reduce the risk of accidents at sea and improve the safety and security of all on board.

- **Inadequate Rescuing Means:** Another policy problem is inadequate rescuing means. Ships that do not provide sufficient safety equipment, such as life jackets, lifebuoys, or rescue boats, can endanger the safety of passengers and crew. In addition, weak regulations related to ship maintenance and inspection can also be a problem. Ships that are improperly maintained and not inspected periodically can experience damage, which can endanger the safety of passengers and crew. Another policy problem is the lack of strict law enforcement against ship safety violations. Many ships violate safety rules and do not receive adequate sanctions. This can be detrimental to the safety of passengers and crew and can open up opportunities for ship disasters. Therefore, serious attention and stricter law enforcement are needed to deal with ship safety issues. The government and related parties need to carry out stricter supervision of ships and provide adequate rescue facilities to maintain the safety of passengers and crew.
- **No Enforced Regulations:** Another policy issue is the lack of strictly enforced regulations in Sea Transportation on Penyengat Island. Ship operators may neglect safety without strict rules, as sufficiently severe penalties do not pressure them. In addition, some ship operators may ignore critical environmental aspects, such as waste disposal into the sea, because no rules support environmental policies. Another problem is the lack of supervision and law enforcement against violations committed by ship operators. Without adequate control, problematic behaviour can continue, thus hurting sea transportation activities. This triggers the emergence of various forms of irregularities, such as the use of ships that are old and do not meet safety standards, low payment of workers' wages, and inadequate work facilities. Therefore, there is a need for clear and firm regulations that address sea transportation on Penyengat Island. The law must have severe sanctions for violators and adequate supervision from the authorities. In addition, cooperation is also needed between the government, employers, and the community to improve safety standards and a good work environment in sea transportation on Penyengat Island. That way, sea transportation on Penyengat Island can develop safely while preserving the natural surroundings and the welfare of workers.
- **Lack of adequate facilities and infrastructure,** such as access to the port inspection of facilities and infrastructure, must be a severe matter to pay attention to. Sufficient facilities and infrastructure will help improve

the effectiveness of sea transportation safety. In addition, preventive policies, such as implementing stricter safety standards for ships and crew, must be implemented to reduce the risk of accidents. Training crew members on safety, evacuation, and emergency procedures must also be improved. The government and related parties must work together to ensure all operating vessels comply with predetermined safety standards. Periodic checks must be carried out on ships to ensure that all safety systems and equipment function properly. In addition, it is essential to develop supporting infrastructure such as shelters, ambulances, and adequate lighting equipment to ensure that passengers can be handled quickly in an emergency. By maintaining facilities and infrastructure and optimizing preventive policies, sea transportation can be a safe and comfortable way to travel. This can help increase public confidence in sea transportation on Penyengat Island.

- Lack of Role from the Community: The role of the community in paying attention to the safety of sea transportation is also a policy issue. Lack of public participation and awareness in maintaining transportation safety can increase the risk of maritime accidents. Therefore, dissemination of the safety of sea transportation is urgently needed so that public awareness grows on Penyengat Island. This socialization can be done in various ways, such as:
  - a) Organize sea transportation safety campaigns in various mass media such as television, radio, and newspapers.
  - b) We are holding seminars or workshops on maritime transportation safety in areas prone to sea accidents.
  - c) We are educating the public about the importance of using safety equipment such as life and life jackets.
  - d) Provide easy access to information such as an emergency hotline to report incidents during the voyage.

In this case, the role of the Government and sea transportation managers is also significant in strengthening public awareness of the safety of sea transportation. The government can carry out infrastructure development programs related to sea transportation and incentivize sea transportation managers who comply with and meet safety and security standards. Sea transportation managers must also ensure that the ships operated meet predetermined sea safety standards [17], [18]. Public participation and awareness play an important role in improving the safety of sea transportation. With proper socialization and education, public awareness of maritime transportation safety can increase so that the risk of marine accidents can be avoided or minimized. The above descriptions should concern the authorities in formulating a safe and comfortable sea transportation safety policy on Penyengat Island, Tanjungpinang City.

#### *Evaluation in the Formulation of the Sea Transportation Policy on Penyengat Island*

Policy evaluation in formulating policies for the safety of sea transportation on Penyengat Island, Tanjungpinang City, is essential. This evaluation helps assess the effectiveness, efficiency, and achievement of the objectives of the policies

that have been implemented to improve the safety of sea transportation on Penyengat Island. Several things that need to be evaluated in the marine transportation safety policy [19]–[21] include:

- Implementation of sea transportation policies and regulations on Penyengat Island: This evaluation includes the extent to which rules and regulations made by the government regarding the safety of sea transportation have been appropriately implemented. In this case, corrective steps are needed to keep these policies and rules up to date and improve the safety of sea transportation on Penyengat Island. First, an evaluation can be carried out by looking at how effectively this is implemented by the relevant parties in supervising sea transportation activities. This includes various aspects, such as implementing safety standards, measures to prevent accidents, supervision of ships and crew, and environmental pollution monitoring. In addition, an evaluation can also be carried out by looking at how effective existing regulations are in overcoming problems that arise from time to time, such as increasing classes and types of ships, weather changes, and changes in the behavior of fishermen and users of sea transportation services. In this case, corrective steps that need to be taken can be in the form of improving the supervision and monitoring system, increasing the workforce's capacity and providing adequate infrastructure, and a more effective monitoring and law enforcement mechanism. These corrective steps must be supported by the active involvement of all parties, including the government, the community, fishermen, and users of sea transportation services. This will ensure that sea transportation policies and regulations on Penyengat Island can be implemented effectively and sustainably to improve the safety and welfare of the community.
- Law Enforcement: This evaluation includes how well law enforcement has been running well in implementing sea transportation safety policies and regulations. The presence of officers who specifically handle cases of maritime accidents will significantly help to increase the effectiveness of law enforcement. In addition, the government also needs to improve training and certification for crew members and ensure that safety standards are met in all aspects of ship operation. In this case, evaluation and improvement must be carried out continuously to ensure that the steps taken can positively contribute to the safety and security of sea transportation on Penyengat Island. Finally, it is also essential to form a marine safety awareness community that can involve all stakeholders and the local community to increase awareness of the importance of maritime transportation safety.
- Human Resources in evaluating marine transportation policies on Penyengat Island: This evaluation focuses on the ability and quality of the officers in charge of maintaining the safety of sea transportation. It is necessary to increase capacity and training for business actors and related officers to become more professional and competent. In addition, it is also essential to supervise and monitor officers to ensure that they work correctly and follow established standards. In this evaluation, it is also necessary to consider other factors such as level of education, experience, physical and

mental health, and motivation and support from management. These things must be viewed together to ensure that the human resources involved in sea transportation on Penyengat Island can provide quality and safe services for passengers and service users. Thus, evaluating sea transportation policies on Penyengat Island will be more effective and successful in creating a safer, more efficient, and environmentally friendly transportation system.

- **Information and Communication System:** This evaluation includes the extent to which information and communication system technology used in implementing maritime transportation safety policies has effectively improved system performance, increased the quality of available data, and ensured that the information produced is timely and accurate. Information and communication systems are essential in evaluating marine transportation safety policies on Penyengat Island. In this case, information and communication system technology can collect data and information about ship traffic, weather, and sea conditions. In addition, this technology can also be used to monitor ship position, engine condition, and ship navigation to improve system performance and prevent sea accidents. The information received by sailors can be used to avoid potential marine accidents. In addition, the quality of available data can also be improved by using information and communication system technology. The data used in evaluating sea transportation safety policies on Penyengat Island must be accurate and timely to prevent errors in decision-making. Finally, information and communication system technology can ensure that the information generated regarding marine transportation safety policies is timely and accurate, enabling appropriate and effective decision-making. In conclusion, using information and communication system technology in evaluating marine transportation safety policies on Penyengat Island is very important and influential for improving system quality, data quality, and information accuracy for better and more effective decision-making.
- **Protection of Consumer Rights:** This evaluation includes the extent to which the protection of consumer rights in maritime transportation safety has been adequately provided. This is important to ensure that consumers feel safe and comfortable when using sea transportation and also protect them from fraud that could threaten the safety of passengers. Protection of consumer rights in evaluating sea transportation policies on Penyengat Island includes several aspects that are important to note, including:
  - a) **Sea Transportation Safety:** The government and shipping companies must ensure that all ships operating in the waters of Penyengat Island comply with predetermined safety standards. The government also needs to tighten supervision of companies that do not meet safety standards and violate existing regulations.
  - b) **Availability of clear and complete information:** The government and shipping companies must provide clear and comprehensive information regarding shipping routes, departure schedules, ship facilities, and applicable rates. This is important to help consumers make the right decisions and reduce the risk of fraud.

- c) **Complaints and Dispute Resolution:** The government and shipping companies must have an effective and speedy complaint and dispute settlement mechanism. Consumers who feel aggrieved or have problems using sea transportation should be able to report their complaints and get a fair resolution quickly.
- d) **Seafarer Training and Certification:** The government and shipping companies must ensure that seafarers working on ships operating in Penyengat Island waters have undergone appropriate training and certification. This will ensure competence and safety when they carry out their duties on board.
- e) **Supervision and Monitoring:** The government and shipping companies must regularly supervise and monitor ships operating in the waters of Penyengat Island. This will help monitor the company's performance and detect early if there are problems in ship operations.

Considering these aspects, it is hoped that evaluating sea transportation policies on Penyengat Island can provide good protection for consumer rights in the context of sea transportation safety. This will help improve the quality of sea transportation services on Penyengat Island and give a sense of security and comfort to passengers using these transportation services. In implementing sea transportation safety policies on Penyengat Island, continuous evaluation must be carried out to determine the performance, effectiveness, and efficiency of the policies that have been implemented. This is very important to ensure that the approaches taken can continue to develop and ensure that the safety of sea transportation is maintained correctly.

#### IV. CONCLUSIONS AND SUGGESTIONS

In conclusion, the safety of sea transportation in Penyengat Island, Tanjungpinang City, is a crucial issue requiring adequate policy formulation. The policymakers must prioritize the safety and security of passengers, crew members, and vessels operating in the region. The policy formulation must involve the participation of various stakeholders, including the local communities, transportation companies, and government agencies. Key aspects that need to be included in the policy formulation include establishing and enforcing safety regulations and standards, improving emergency response systems, regular maintenance and inspection of vessels, and monitoring weather conditions.

Additionally, there may be a need to provide training and capacity building for the crews and install safety equipment on the ship, among others. Overall, the policy formulation must ensure that the safety of sea transportation is a top priority and that all measures are aligned with international safety standards. Such an approach will enhance passengers' safety and security, boost stakeholder's confidence in the industry, and promote the region's overall economic development. Furthermore, continuous monitoring and evaluation of the policy's implementation and effectiveness are essential to ensure it achieves its objectives. Regular checks and inspections of vessels, facilities, and equipment should be conducted to identify any safety risks and implement corrective actions promptly.

In case of accidents or incidents, proper investigation and reporting mechanisms should be in place to determine the causes and prevent future occurrences. Ultimately,

improving the safety of sea transportation will benefit the passengers and stakeholders and contribute to the region's sustainable development. It will attract more tourists, boost trade and commerce, and provide better access to social services and opportunities. Therefore, it is necessary to invest in the safety and security of sea transportation in Penyengat Island, Tanjungpinang City, to promote the region's growth and prosperity in the long run.

## REFERENCES

- [1] A. W. Swastiwi, "Penyengat Island Riau Island: Towards A World Heritage," *International Journal of Environmental, Sustainability, and Social Science*, vol. 3, no. 1, pp. 116–129, 2022, doi: 10.38142/IJESS.V3I1.169.
- [2] K. J. Khotimah, H. J. Tou, and L. Y. Hastini, "Kajian Kesiapan Masyarakat Pulau Penyengat Sebagai Kawasan Wisata Budaya," *Abstract of Undergraduate Research, Faculty of Civil and Planning Engineering, Bung Hatta University*, vol. 1, no. 3, Feb. 2019, Accessed: Aug. 21, 2022. [Online]. Available: <https://ejournal.bunghatta.ac.id/index.php/JFTSP/article/view/14324>
- [3] V. Matheson, "Pulau Penyengat: Nineteenth Century Islamic Centre of Riau," *Archipel*, vol. 37, no. 1, pp. 153–172, 1989, doi: 10.3406/ARCH.1989.2567.
- [4] R. Destiana and K. Kismartini, "Halal tourism marketing in the disruption era: a case study of penyengat island in Riau Islands province," *Society*, vol. 8, no. 1, pp. 264–283, Jun. 2020, doi: 10.33019/SOCIETY.V8I1.174.
- [5] P. M. Panayides, "Maritime policy, management and research: role and potential," *Maritime Policy & Management*, vol. 33, no. 2, pp. 95–105, May 2006, doi: 10.1080/03088830600678757.
- [6] M. Celik and A. Kandakoglu, "Maritime policy development against ship flagging out dilemma using a fuzzy quantified SWOT analysis," *Maritime Policy & Management*, vol. 39, no. 4, pp. 401–421, Jul. 2012, doi: 10.1080/03088839.2012.689876.
- [7] H. N. Psaraftis, "Maritime safety: To be or not to be proactive," *WMU Journal of Maritime Affairs*, vol. 1, no. 1, pp. 3–16, 2002, doi: 10.1007/BF03195022/METRICS.
- [8] Y. Zhang, C. Loh, P. K. K. Louie, H. Liu, and A. K. H. Lau, "The roles of scientific research and stakeholder engagement for evidence-based policy formulation on shipping emissions control in Hong Kong," *J Environ Manage*, vol. 223, pp. 49–56, Oct. 2018, doi: 10.1016/J.JENVMAN.2018.06.008.
- [9] C. J. Cohen and R. M. Cyert, "Strategy: Formulation, Implementation, and Monitoring," *The Journal of Business*, vol. 46, no. 3, pp. 349–367, 1973, Accessed: Jul. 22, 2023. [Online]. Available: <https://www.jstor.org/stable/2351385>
- [10] J. A. Pearce and R. B. Robinson, *Strategic management: Formulation, implementation, and control*. Boston: McGraw-Hill Irwin, 2009.
- [11] M. S. Sidney, "Policy formulation: Design and tools," in *Handbook of Public Policy Analysis: Theory, Politics, and Methods*, F. Fischer and G. J. Miller, Eds., United States America: CRC Press, 2006, p. 672.
- [12] J. R. Tumpenny, A. J. Jordan, D. Benson, and T. Rayner, "The Tools of Policy Formulation: An Introduction," in *The Tools of Policy Formulation: Actors, Capacities, Venues and Effects*, Cheltenham, U: Edward Elgar Publishing, 2015, pp. 3–29.
- [13] R. Groff, "Critical realism, post-positivism, and the possibility of knowledge," in *Volume 11 dari Routledge Studies in Critical Realism*, Routledge, 2004.
- [14] M. Q. Patton, *Qualitative research & evaluation methods*. Sage Publications, 2014.
- [15] A. A. Pallis, "Institutional Dynamism in EU Policy-Making: The Evolution of the EU Maritime Safety Policy," *J Eur Integr*, vol. 28, no. 2, pp. 137–157, 2006, doi: 10.1080/07036330600615797.
- [16] P. Haapasaari, I. Helle, A. Lehtikoinen, J. Lappalainen, and S. Kuikka, "A proactive approach for maritime safety policy-making for the Gulf of Finland: Seeking best practices," *Mar Policy*, vol. 60, pp. 107–118, Oct. 2015, doi: 10.1016/J.MARPOL.2015.06.003.
- [17] Z. L. Yang, J. Wang, and K. X. Li, "Maritime safety analysis in retrospect," *Maritime Policy & Management*, vol. 40, no. 3, pp. 261–277, May 2013, doi: 10.1080/03088839.2013.782952.
- [18] J. Yu, S. Voß, and G. Tang, "Strategy development for retrofitting ships for implementing shoreside electricity," *Transp Res D Transp Environ*, vol. 74, pp. 201–213, Sep. 2019, doi: 10.1016/J.TRD.2019.08.004.
- [19] T. R. Walker, "Green Marine: An environmental program to establish sustainability in marine transportation," *Mar Pollut Bull*, vol. 105, no. 1, pp. 199–207, Apr. 2016, doi: 10.1016/J.MARPOLBUL.2016.02.029.
- [20] J. C. Kurth, P. D. Krauss, and S. W. Foster, "Corrosion Management of Maritime Infrastructure," *Transportation Research Record: Journal of the Transportation Research Board*, vol. 2673, no. 12, pp. 2–14, Jun. 2019, doi: 10.1177/0361198119855333.
- [21] P. Siegesmund, D. Luskin, L. Fujiwara, and M. Tsigas, "A Computable General Equilibrium Model of the U.S. Economy to Evaluate Maritime Infrastructure Investments," *Transportation Research Record: Journal of the Transportation Research Board*, no. 2062, pp. 32–38, Jan. 2008, doi: 10.3141/2062-05.

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